

Technology Opportunity

Power Processing Technologies

The National Aeronautics and Space Administration (NASA) seeks to transfer an advanced actuator control technology that is being developed for future spacecraft and aircraft.

Potential Commercial Uses

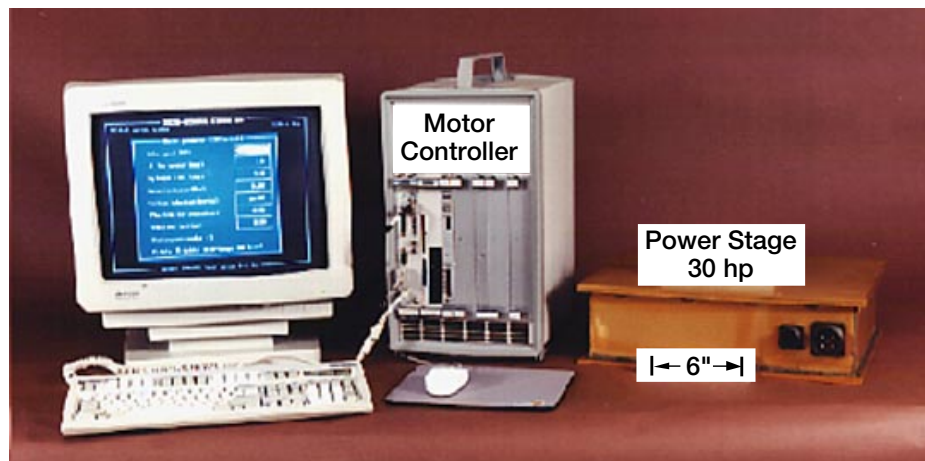
- Adjustable speed drives
- Heating/air conditioning systems, especially nonchlorofluorocarbon (non-CFC) configuration
- Electric vehicles
- Electromechanical actuators (EMA's) for aircraft/spacecraft
- Actuators for amusement rides and robotics

Benefits

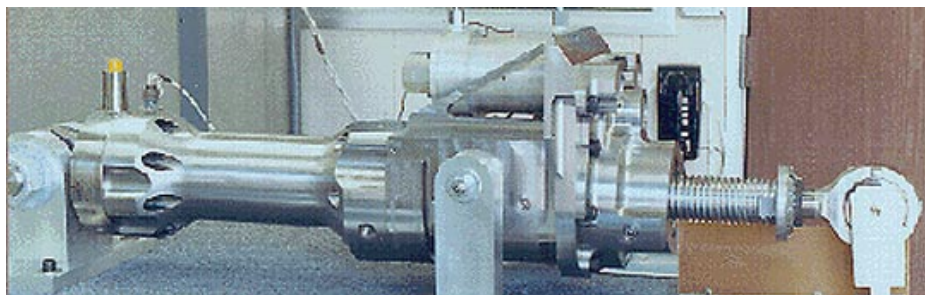
- Increased aircraft reliability
- More efficient adjustable speed drives
- Elimination of hazardous/leaky hydraulics and CFC's
- Potential for smaller size and lower weight

The Technology

Historically, actuation on airplanes and spacecraft has been accomplished by hydraulic means. In an effort to eliminate the leakage hazards associated with the hydraulic systems, NASA Lewis has developed a way to precisely control these same



EMA system components



Actuator



National Aeronautics and
Space Administration
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surfaces by using electromechanical actuators that incorporate advanced induction motors and control schemes. These technologies are not only applicable to air/space vehicles, but are also suitable for systems requiring adjustable speed drives.

The technology incorporates induction motors, which have been the workhorse of industry for years because of their robust nature and high-temperature operation. Advancements in both power electronics and data processor technology have enabled the servo control of the induction motors. Incorporating a soft-switched power processing technology has resulted in smaller sized electronics with high efficiencies. Three motor control systems have been developed and tested to a maximum of 30 kVA; advanced induction motors have been constructed (both single and dual stator models); and an actuator designed to shuttle specifications has been installed in the NASA Lewis labs. NASA is also in the process of developing various other EMA systems that use advanced switching and control technologies.

Prototype motors and control systems have been developed by Lockheed-Martin (formerly General Dynamics Corp.) under contract to NASA Lewis Research Center. Current programs are focused on demonstrating alternative advanced control schemes with induction and permanent magnet motors.

Options for Commercialization

Although current efforts are directed toward applying this technology to spacecraft and aircraft, there is also a potential for use in the automobile, air conditioning, and adjustable speed drive industries. NASA researchers are interested in further developing the technology for terrestrial applications and packaging the hardware in user-friendly modules. If your company is interested in possible licensing of the power processing technology, please contact us.

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Key Words

Actuator
Induction motor
Soft switched converter
Servo control



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